SYMPTOMS OF GRAVE DISEASES OF THE NERVOUS SYSTEM RELIEVED BY RESTORATION OF THE EQUILIBRIUM OF THE MUSCLES OF THE EYE.

Dr. J. F. Fulton, professor of ophthalmology and otology in the University of Minnesota, recounts his successes in this direction. In 260 cases of heterophoria in which he operated, cephalalgia was present in 190 cases. In the vast majority of these cases the headache was cured; in nearly all relieved. This fair degree of success prompts him to go to the extreme and to say, that before *any* case of headache is treated, the condition of the ocular muscles should first be tested. In three cases which he terms chorea of the lids and face in children between ten and twelve years of age, the symptoms were completely relieved by a partial tenotomy of some one of the recti with correction of the abnormal refraction. He has had no experience with epilepsy. Neurasthenia in a business man of forty, who had vainly consulted the celebrities in neurology of the metropolis of four countries in both hemispheres, yielded to his magic touch. Even cases of hemianæsthesia, with partial unconsciousness, vertigo, complete aphasia, diplopia, and hemiopia, causing the physician in charge to fear the existence of some cerebral lesion, were cured by a few snips of the scissors, of a stroke or two of the knife. In closing, however, he says: My conclusions are exactly those of Dr. Webster, viz.: (1) No person should have a tenotomy performed *solely* because he is the subject of heterophoria. (2) But slight degrees should be corrected where troublesome symptoms exist which may be due to the too great use of nervous force in co-ordinating the eyes. (3) Other means should be resorted to before trying tenotomy, but unnecessary delays should be avoided. (4) Tenotomies should be performed under cocaine. (5) In judiciously selected cases, where the operation is properly performed, the average results will be quite as satisfactory as the results of most other surgical operations.—*Northwestern Lancet*, Feb. 1, 1890. W. W. S.

THE EFFECT OF STIMULATION ON THE POLARIZATION OF NERVE.

Dr. George Stewart has made an elaborate study of the subject. In his first paper he determines whether stimulation has any effect on the polarization of a nerve. Hermann assumed for the explanation of the apparent change of resistance produced in a nerve by tetanizing that the positive polarization during the flow of the polarizing current is increased by stimulation. The question then is, how is the polarization after current affected by stimulation? He studied this in two ways. In one the polarization was allowed to become pretty steady and then the nerve tetanized and the effect observed. In the other the stimulation was continued during the whole flow of the polarizing current and the amount of polarization compared with that produced by a similar current when the nerve was at rest. These two methods were used, but as a matter of fact the latter method is not suitable for long periods of flow as the former, because the prolonged tetanus exhausts the nerve. There is this difference between the methods, that in the first case the stimulus acts upon a polarization already established, while in the second it may be supposed to influence the establishment of that of polarization. His apparatus was arranged so that any one of the three circuits could be closed at will. In one of these the circuit was the nerve and battery, in the second the nerve and the galvanometer, and in the third the nerve battery and galvanometer. The sciatic nerve of a frog was used, and his results were as follows:

I. The effect produced by stimulation is in the direction of diminution of the positive polarization. 2. Within limits the effect is somewhat greater the longer the time of flow of the polarizing stream. 3. The effect increases within limits with the density of the polarizing current. 4. As might be expected the effect increases with the strength of the stimulus. In his second paper he considers more in detail the work of his preceding paper. The object of the inquiry was to investigate the electrical changes which take place in a polarized nerve when it is stimulated both during the flow and after the opening of the polarizing current, so far as these changes have not hitherto been studied or where the study of them has been incomplete. He tried to obtain not only qualitative but also quantitative results, relying in the latter case rather on comparison of different experiments upon the same nerve than on observations made on different nerves at different times.

1. Galvanometric observations during the flow of the polarizing current where the whole intra-polar area is led off to the galvanometer—I. Stimulating electrodes in extra-polar region—here with stimulation on the anodic side, a limiting intensity of current can be reached for which the stimulating effect disappears altogether.

2, Stimulating electrodes in intra-polar region. When we come to the comparison of the extra and intra polar effect with intra-polar stimulation, we shall find additional evidence to show that the anode becomes impassable about the time when the intra-polar area in general has lost its conductivity and excitability. On the other hand, it is seen that long after the cathodic block has developed itself intra polar stimulation is effective, producing indeed somethiug like its maximum effect with the current density which corresponds to the beginning of the block.

II. Galvanometric observations during the flow of the polarizing current, when an extra polar area is led off to the galvanometer. 1. Stimulating electrodes extra polar. Here it may be said that in general even 20" after opening the polarizing current the after effect on the cathodic side is greater than the effect during the flow, while on the side of the anode this relation is reversed. 2. Stimulating electrodes in the intra polar region. Here the chief points of difference between these results and those with extra polar stimulation are, (1), the almost complete absence of any stimulation effect on the side of the cathode, except with the weakest currents, and (2), the absence of the positive effect on the anodic side.

III. Observations during the flow of the polarizing current, when the whole intra-polar area is led off to the galvanometer alternately with an extra-polar area. Here the intra-polar effect and the extra-polar anodic effect rise and fall together. The maxima and minima of the two effects correspond closely enough. From the preceding data he arrives at the conclusion that the stimulative effects during the flow of the polarizing current cannot be explained entirely as secondary action currents, but are probably due to the super-position of such currents on electro-tonic variations.

IV. Observations after opening the polarizing current when the whole intra-polar area is led off to the galvanometer. 1. Stimulating electrodes, extra-polar. Here the stimulative effect may fail altogether after the opening of a strong current if the excitation has to pass the anode, while if it has onlyto pass the cathode we may have a large effect. 2. Stimulating electrodes, intra-polar. Here the direction of the polarizing current is without influence on the amount of the stimulation deflection.

V. Observations after opening the polarizing current where an extra polar region is led off to the galvanometer. 1. Stimulating electrodes, extra polar. When the polarizing current is ascending we get a cathodic after current in the same direction. When the polarizing current is descending, the main anodic after-current in the opposite direction is the one which affects the galvanometer. 2. Stimulating electrodes, intra-polar. Here as before the sign of the effect is positive in the anodic area, negative in the cathodic.

VI. Observations after opening the polarizing current when the intra and extra polar regions are led off alternately to the galvanometer, the stimulating electrodes being extra polar. The general result was that a large extra polar effect was associated with a small intra-polar effect.

VII. Observations after opening the polarizing current when a part of the intra-polar area is led off to the galvanometer.

(1.) Stimulating electrodes, extra-polar. When the excitation has to pass the cathode the effect diminishes, when any considerable portion of the intra-polar area lies between it and the led off part and it disappears ultimately.

(2.) Stimulating electrodes, intra-polar. Here in general, when the anode is in the led off area, the effect is the greatest.

VIII. Observations after opening the polarizing current when the whole intra-polar region and part of it or two different parts of it are led off successively to the galvanometer, the stimulating electrodes being extra-polar. The results are that except with the strongest currents the effect is greater when the galvanometer is connected with the anode than when it is connected with the cathode.

IX. Experiments on muscular contraction, with intra-polar stimulation.

(1.) During the flow of the polarizing current.

Up to a certain strength of current a stimulus will give contraction when the cathode lies next to the muscle, which will give no contraction when the anode is in that position. Above this strength the reverse holds good and a stimulus which is followed by contraction when the excitation has to pass the anode, evokes no response when it has to pass the cathode.

(2.) After opening the polarizing current his results were as follows:

1. With a very short time of closure. *a.*—If we adjust the stimulus so that contraction shall occur immediately on opening the descending current there will be no contraction for some time after opening the ascending current. *b.*—If we adjust the stimulus so that contraction shall not occur for some time after opening the descending current it will take a longer time to appear after the ascending current.

2. If we determine the strength of the stimulus which is just necessary to give contraction immediately after opening, it will come out greater for the ascending than for the descending current.

3. When an interval has existed during which the stimulus has been inoperative, the contraction does not reach its original height for some time after the stimulus has again become effective, and this time is longer after the ascending than after the descending current. He does not see how the conclusion can be avoided that after opening the polarizing current a rapid, perhaps instantaneous reversal of the relations of the poles takes place.

The remainder of the paper is devoted to a discussion of preceding facts in regard to conductivity and excitability, He states, " I do not now say that excitability and conductivity are separable properties. What I say is that we know nothing in the manner of propagation of a nerve impulse which goes against such a supposition. We know much which supports it."—*The Journal of Physiology*, vol. ix., No. 1, 1888; and vol. x., No. 6, 1889. ISAAC OTT.

EXCERPTS FROM ITALIAN JOURNALS.

BY ALBERT PICK AND F. H. PRITCHARD, M.D., BOSTON.

ON TWO CASES OF RUMINATION IN THE INSANE.

Dr. G. B. Verga (Archivo Italiano per le malattie nervose, 1886, xxvi., p. 149). The writer, after giving a review of the relatively rich literature on rumination in man, communicating at the same time two cases of his own with post-mortem results, turns to the explanation of this phenomenon. That it is not a disease which most writers admit is seen from the most various pathological results found in patients with this symptom, as well as a perfectly normal condition of the organs of deglution and digestion; especially does he object to those writers, who, like Cantanaro, would have it regarded as an atavistic sign. Even Cantaro had to confess that very many of his 69 cases from literature, of which only 36 were mentally abnormal, had not ruminated from childhood; hence it was to be regarded as an acquired peculiarity—according to the writer, as a bad habit. Thus it is chiefly found in avoracious individuals, for example, in imbeciles, then in people who have no time to eat, and especially in children, in business men, learned men, etc., and finally in persons with faulty apparatus of mastication.

Hence, one should strike merycisus from the list of degenerative and atavistic phenomena.

SURGICAL OPERATIONS AS A CAUSE OF INSANITY.

Dr. R. Gucci (Rivista sperimentale di Freniatria, 1889, xv., p. 50). The writer, in his excellent treatise on surgical operations as a cause of mental disturbances, first excludes